

## ACTIVITY 0.4 DESIGN YOUR SPACESUIT!

From the Pre-launch Chapter of the Principia Space Diary  
<http://principiaspacediary.org/activities/design-your-spacesuit>

### LEARNING LEVEL

KS1, KS2, P1-5

### CURRICULUM LINKS & DIFFERENTIATION IDEAS

View detailed curriculum links for England, Scotland, Northern Ireland and Wales, plus differentiation ideas for your region and year level.

[principiaspacediary.org/curriculum-planner/](http://principiaspacediary.org/curriculum-planner/)



### Resources Required

- Coloured pens or pencils
- Optional: Fact sheets on spacesuit materials – tin foil for reflection, cotton wool for insulation

### Background to the Activity

A spacesuit isn't just a uniform, it's like a personalised, human-shaped spacecraft designed to keep astronauts alive in space. There are two types of space suits: one for travelling to and from space, and one for doing spacewalks (EVAs).

The EVA suits for space walks have lots of different jobs to do. They provide the astronaut with air to breathe, keep them warm or cool, protect from debris flying through space, allow the astronaut to move fairly freely and even have rocket boosters in case the astronaut gets into trouble! The suits are heavy on Earth but zero gravity in space makes them feel light.

When travelling to the ISS and back to Earth, Tim Peake wore a Sokol spacesuit, which is different to the one he used on his space walks. 'Sokol' means 'falcon' in Russian, and it is a rescue suit. This is the same design as the one that Helen Sharman wore when she went to the Mir Space Station. The main features of this type of space suit are:

- Two layers: the inner one is rubberised and the outer one is made of white nylon.
- Boots that are built into the suit and space gloves attached at the wrists by special aluminium fastenings.
- A helmet that is also part of the suit. To put the suit on you have to squeeze your head through a neck seal into the helmet, which has a visor on a hinge (so you can open it). The seal at the neck means you can float in water on landing and open your visor without

your whole suit flooding!

- An air valve. An oxygen supply connected to the suit is activated in times of de-pressurisation.
- A radio and microphone to communicate

### Running the Activity

Encourage older pupils to use a range of material samples to design the suit. This works well fastened on as a 'swatch' using a treasury tag. Ideas:

Tin foil: to reflect radiation

Cotton wool: for insulation – to trap air

Black inside: to absorb heat

White outside: to reflect heat radiation

### Questions for the Class

- What are the different parts of the spacesuit?
- Why is the spacesuit made like a onesie?
- How heavy will the spacesuit feel in space?
- How do you go to the toilet when you are in the spacesuit?

### Extensions & Digital Resources

**ZAP!** Students can access use the Zappar app to find out more about Tim Peake's spacesuit and to see a video with Lucy Hawking and Dallas Campbell discussing spacesuits at the Science Museum. See Zappar instructions at the link below and note that the mobile/tablet will need to be connected to the internet: <http://principiaspacediary.org/using-zap-codes-to-strengthen-digital-literacy/>